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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/674,669

09/30/2003

Mario Elmen Tremblay

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02/16/2007

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EXAMINER

ZHENG, LOIS L

ART UNIT

PAPER NUMBER

1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/674,669	TREMBLAY ET AL.	
	Examiner	Art Unit	
	Lois Zheng	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7 November 2006 has been entered.

Status of Claims

2. Claims 1, 9 and 15 are amended in view of the amendment filed 7 November 2006. Therefore, claims 1-15 are currently under examination.

Previous Rejections

3. The rejection of claims 1-8 and 15 under 35 U.S.C. 112, first paragraph, is withdrawn in view of applicant's amendment filed 7 November 2006.

The rejection of claim 9 under 35 U.S.C. 112, second paragraph, is withdrawn in view of applicant's amendment filed 7 November 2006.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claims 1, 9 and 15 recite the limitations "[t]he inlet is configured to allow the aqueous feed solution to the inlet at about 10 to about 1000 ppm" and "[t]he outlet is configured to allow effluent to exit out the outlet at about 0.1 to about 2 ppm". These two limitations are vague and indefinite since it is unclear which component of the feed solution and/or the effluent the recited concentrations are directed to. Therefore, the scope of the claims is not clearly defined.

In the current Office Action, the examiner interprets that the feed solution concentration of about 10 to about 1000 ppm is directed to the concentration of chlorite salt such as sodium chlorite and the effluent concentration of about 0.1 to about 2 ppm is directed to the concentration of chloride dioxide.

Claims 2-8 and 10-14 are also rejected since they depend on the rejected claims 1, 9 and 15.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kelley US 6,306,281 B1(Kelley).

Kelley teaches an electrolytic apparatus for the generation of chlorine dioxide(abstract). The apparatus comprises an aqueous sodium chlorite feed solution(col. 2 lines 55-61), a non-membrane electrolysis cell comprising an anode, a

cathode, an inlet, an outlet(Fig. 1) and a power source connected to the anode and the cathode(col. 3 lines 18-21).

Regarding claim 1, the inlet, the gap between the anode and the cathode of Kelley and the outlet read on the claimed passage for the feed solution adjacent to the anode. The claimed electric current supply is inherently present since Kelley teaches a power source connecting the anode and the cathode.

In addition, the claimed concentration limitations on the aqueous feed solution and the effluent are directed to a material that is worked on by the instantly claimed apparatus. As stated in MPEP 2115, it is well settled that "Expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim." *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969). Furthermore, "[i]nclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims." *In re Young*, 75 F.2d 996, 25 USPQ 69 (CCPA 1935) (as restated in *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963)). Therefore, the instantly claimed concentration limitations on the solution being worked on by the claimed apparatus do not rendered the claimed apparatus patentable. In addition, Kelley shows in various examples that its apparatus is capable of electrolyzing feed solutions with various sodium chlorite concentrations and produces a wide range of different final chlorine dioxide concentrations. Since the structure of Kelley's chlorine dioxide generating apparatus is the same as claimed apparatus and is capable of working with a wide variety of feed sodium chlorite concentrations and producing a wide variety of chlorine dioxide

concentrations as desired, the examiner concludes that the apparatus of Kelley is inherently capable of working with the claimed aqueous feed solution concentration and produce the claimed effluent concentration.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley in view of Spence US 4,414,070(Spence).

The teachings of Kelley are discussed in paragraph 7 above. However, Kelley does not explicitly teach the claimed gap between the anode and the cathode.

Spence teaches that the efficiency of electrolytic cells is dependent upon the anode-cathode distance, and that as the distance decreases the efficiency increases(col. 1, lines 24-29). Therefore, Spence's teaching shows that the gap between an anode and a cathode is a result effective variable.

Therefore, it would have been obvious to one of ordinary skill in the art to have routinely optimized the gap between the anode and the cathode to achieve a minimized spacing, such as 0.5 mm or less as claimed in order to maximize the cell efficiency as taught by Spence.

10. Claims 3-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley in view of Kaczur et al. US 5,106,465(Kaczur).

The teachings of Kelley are discussed in paragraph 7 above. Kelley further teaches the use of a dimensionally stable platinum coated titanium anode(col. 3 lines 13-18).

However, Kelley does not explicitly teach that the metal anode is porous.

Kaczur also teaches an electrolytic cell for the generation of chlorine dioxide (abstract). Kaczur further teaches the use of a porous platinum coated titanium anode(col. 4 lines 41-63).

Regarding claim 3, it would have been obvious to one of ordinary skill in the art to have incorporated the porous platinum coated titanium anode of Kaczur into the electrolytic apparatus of Kelley in order to utilize the high surface contact area due to the porosity of the anode and achieve high corrosion resistance as taught by Kaczur(col. 4 lines 44-45 and 57-60).

Regarding claims 4-5 and 7-8, Kazcur further teaches that chlorine dioxide is widely used as a disinfectant in water treatment/purification(col. 1 lines 16-19). Therefore, it would have been obvious to one of ordinary skill in the art to have established an interface between the chlorine dioxide generator of Kelley and any appliances that requires water disinfecting and purification, such as the claimed water purifier, water fountains, refrigerators, etc. in order to effectively purify water as taught by Kazcur before consumption. In addition, the connection between the electrolytic cell and the water inlet of the appliance and the water/ice dispensing device of the appliance would have inherently been present in the apparatus of Kelley in view of Kazcur in order

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to purify untreated water into the appliance and convert it into purified water being dispensed for consumption.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley in view of Kaczur and further in view of DE'407.

The teachings of Kelley and of Kaczur are discussed in paragraphs 7 and 10 above. However, Kelley in view of Kaczur do not explicitly teach that the halogen dioxide generator is interfaced with an appliance via a connection of water inlet line to the inlet of the electrolytic cell and an connection of an outlet line from the outlet of the electrolysis cell to the inlet of the appliance.

DE'407 teaches an electrolytic apparatus for continuously treating/purifying water via electrolysis of chlorine dioxide from sodium chlorite (page 4 paragraph 0016, pages 5-6 paragraph 0021).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the continuous water treatment of DE'407 into the apparatus of Kelley in view of Kaczur in order to achieve simple handling, safe production and reduced cost as taught by DE'407 (page 4 paragraph 0016).

Regarding claim 6, the feed line as taught by Kelley in view of Kaczur and DE'407 reads on the claimed connection of a water inlet line. In addition, it would have been obvious to one of ordinary skill in the art to have added the claimed connection from the outlet of the electrolytic cell to the inlet of an appliance as claimed in order to allow the consumption of purified water in various appliances.

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12. Claims 9-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley in view of Zappi et al. US 6,328,875 B1(Zappi), and further in view of Cowley et al. US 5,965,004(Cowley), and further in view of DE '407.

The teachings of Kelley are discussed in paragraph 7 above. However, Kelley does not explicitly teach the claimed non-conducting porous flow barrier separating the anode and the cathode and the claimed return passage for returning the depleted effluent back to the source.

Zappi teaches an electrolysis cell for purifying contaminated water(abstract). Zappi further teaches that its electrolysis cell can also be used for electrochemical synthesis of chlorine dioxide(col. 8 lines 53-62). Zappi's electrolysis cell includes non-conductive porous mesh spacers positioned between the electrodes to provide desired interelectrode spacing(Fig. 4 numeral 23, col. 10 lines 18-21, col. 12 lines 32-38).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the non-conducting porous mesh spacer as taught by Zappi into the electrolysis apparatus of Kelley in order to provide desired spacing between the anode and the cathode as taught by Zappi.

Cowley teaches an electrolytic cell for generating chlorine dioxide(abstract). Cowley further teaches recycling or reverting the remaining processing fluid after electrolysis back to the feed tank containing sodium chlorite solution(Fig. 1, #42).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the recirculation setup of Cowley into the electrolytic cell of Kelley in view

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of Zappi in order to achieve a highly efficient, continuous and effluent free operation as taught by Cowley(col. 1 line 62 – col. 2 line 2).

DE'407 teaches that chlorine dioxide is reduced to chlorite when treating water (page 6 paragraph 0021). Therefore, one of ordinary skill in the art would have found the claimed reversion to halogen dioxide salt(i.e. chlorine dioxide salt) from halogen dioxide(i.e. chlorine dioxide) inherently taking place when the electrolytic apparatus of Kelley in view of Zappi and Cowley is in use in light of the teachings of DE'407.

Regarding claim 9, the remaining claim limitations are rejected for the same reasons as stated in the rejection of claim 1 above.

Regarding claims 10-11 and 13-14, Cowley further teaches that chlorine dioxide can be used for water purification(col. 1 lines 11-14). Therefore, it would have been obvious to one of ordinary skill in the art to have established an interface between the chlorine dioxide generator of Kelley in view of Cowley and DE'407 and any appliances that requires water disinfecting and purification, such as the claimed water purifier, water fountains, refrigerators, etc. in order to effectively purify water as taught by Cowley before consumption. In addition, the claimed connection between the electrolytic cell and the water inlet of the appliance and the water/ice dispensing device of the appliance would have inherently been present in the apparatus of Kelley in view of Cowley and DE'407 in order to purify untreated water into the appliance and convert it into purified water being dispensed for consumption.

Regarding claim 12, the instant claim is rejected for the same reason as stated in the rejection ground of instant claim 6 above.

Regarding claim 15, Kelley in view of Zappi, Cowley and DE'407 teaches the claimed cell chamber and electrolysis cell with an anode, a cathode and a porous barrier separating the anode and the cathode. Kelley further teaches the claimed power source connecting to the anode and the cathode.

Cowley further teaches a feed tank connecting to the electrolysis cell via a passage(Fig. 1 # 12, 14). Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the feed tank as taught by Cowley into the apparatus of Kelley in view of Zappi, Cowley and DE'407 in order to provide feed source to the electrolysis cell.

Zappi further teaches pumping means for pumping the feed to the electrolysis cell(col. 3 lines 29-32 and 59-61). Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated a pump as taught by Zappi into the apparatus of Kelley in view of Zappi, Cowley and DE'407 in order to directing feed solution to the electrolysis cell.

Double Patenting

13. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

14. Claims 1, 9 and 15 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 13-22 of US Patent No. 7,048,842 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 13-22 of US Patent No. 7,048,842 B2 teach an electrolytic apparatus that is structurally substantially the same as that of the instant invention. In addition, the amended concentration limitation for the feed solution does not lend patentability for the instantly claimed apparatus since it is directed to a material being worked on by the claimed apparatus. See MPEP 2115.

15. Claims 1-8 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 26-32, 57-62, 63, and 87-93 of copending Application No. 10/027667 in view of DE'407. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1, 26-31, 32, 57-62, 63, and 87-93 of copending Application No. 10/027667 teaches an electrolytic apparatus that is structurally similar to that of the instant invention.

However, 10/027667 does not explicitly teach the connection between the electrolytic cell and the appliance.

The teachings of DE'407 are discussed in paragraph 8 above.

Since claims 29-31, 60-62 and 91-93 of 10/027667 teaches that the apparatus is adapted to be used in appliances such as water purification devices, refrigerator, etc., it would have been obvious to have incorporated continuous water treatment of DE'407 into the apparatus of 10/027667 in order to achieve simple handling, safe production and reduced cost as taught by DE'407. The connection of between the electrolysis cell and an appliance's water inlet and water/ice dispensing device would have been inherent in light of the teachings of 10/027667 in view of DE'407.

In addition, the amended concentration limitations for the feed solution and the effluent do not lend patentability for the instantly claimed apparatus since they are directed to a material being worked on by the claimed apparatus. See MPEP 2115.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

16. Applicant's arguments filed 7 November 2006 have been fully considered but they are not persuasive.

Regarding applicant's argument that Kelley does not teach the claimed feed solution concentration and effluent concentration as recited in amended claims 1, 9 and 15, the examiner does not find applicant's argument persuasive for the same reasons as stated in the rejection of claim 1 in paragraph 7 above.

Regarding applicant's argument that Kelley and Spence are not combinable, the examiner does not find applicant's argument persuasive since Spence teaches that cell efficiency is dependent on the anode-cathode distance. Spencer further explains that

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the anode-cathode distance is directed to "the vertical spacing between the anodes and the subjacent electrolyte-metal interface"(col. 1 lines 24-29). Therefore, Spencer's teaching implies that the anode-cathode distance can be varied, in the case of Spencer by adjusting the vertical position of the anodes, to control the efficiency of the electrolytic cell. Spencer has shown the anode-cathode distance is a result effective variable. Therefore, one of ordinary skill in the art would have found it obvious to vary the gap between the anode and the cathode via routine optimization to arrive at the claimed gap of 0.5mm or less in order to produce the desired cell efficiency.

Regarding applicant's argument that DE'407, if combined with Kelley in view of Kaczur, would increase costs and increase the complexity of Kelley's apparatus, the examiner does not find applicant's argument persuasive since applicant has not provided specific reasons why DE'407 would increase the cost and the complexity of Kelley's apparatus. In addition, DE'407 teaches that a continuous electrolysis apparatus does not require further addition of chlorite over a long period of time, which would have led to costing savings in chlorite material.

Applicant further argues that there is no motivation to combine Kelley, Zappi, Cowley and DE'407, but does not provide reasons why the combination is improper. Therefore, the examiner does not consider applicant's argument persuasive and the rejection is maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

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